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ABSTRACT

This report describes and evaluates the effectiveness of summer workshops designed to provide high school psychology teachers with an intensive review of general scientific psychology and an opportunity to develop new curricula for use in the classroom. In general, high school psychology teachers are more oriented toward life issues and adjustment, while college teachers stress science. It was the assumption of those conducting the workshops that the successful incorporation of scientific psychology into high school courses depends not only on the teacher's exposure to scientific content but also on the teacher's ability to teach this material with comfort and satisfaction. The morning sessions of the workshops focused on psychological concepts through a combination of lectures, discussions, and films, supplemented by informational handouts. In the afternoons, participants were involved in activities such as conditioning a rat, exploring the operation of depth perception, conducting human learning experiments, carrying out a self-defined observational study, and developing curriculum units tailored to their own needs. During the workshops, participants were surveyed weekly to see how likely it was that they would incorporate the new topics, activities, and materials into their curricula. The surveys showed the workshops to be very successful. For example, in 10 areas where workshop staff combined lectures with demonstrations and activities, the great majority of the participants reported a strong likelihood that they would incorporate these demonstrations and activities into their own curricula. Many of the teachers borrowed materials to use the following year in their classes. It was concluded that if a more scientific curriculum is to be adapted at the secondary level, teachers must be provided with an education in academic psychology. (RM)

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Precollege Psychology as a Science: Can Summer Workshops make a Difference?

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The goals and emphases of psychology courses taught by high school teachers generally differ from those of college teachers (e.g., White, Marcucella, and Oresick, 1979). In general, high school teachers are more oriented toward life issues and adjustment, while college teachers stress science. In response to this discrepancy, the Boston University Psychology Department, with the support of the National Science Foundation, has been offering summer workshops to high school psychology teachers since 1978. The purpose of these workshops is to provide teachers with an intensive review of general scientific psychology in conjunction with an opportunity to develop new curricula for use in the high school. Our assumption is that the successful incorporation of scientific psychology into high school courses depends not only on the teacher's exposure to scientific content but also on the teacher's ability to teach this material with comfort and satisfaction.

The general format of our workshops is to use morning sessions to focus on psychological concepts through a combination of lectures, discussions, and films, supplemented by informational hand-outs. In the afternoons, participants generally are involved in activities such as conditioning a rat, exploring the operation of depth perception, conducting human learning experiments, carrying out a self-defined observational study, developing curriculum units tailored to their own needs, or sharing ideas on field trips, volunteer experiences and use of the media.

As one way of evaluating our program, we administer weekly surveys during the workshops, asking participants how likely it is that they will incorporate the new topics, activities and materials into their curricula. The weekly evaluations completed by participants during three weeks of workshops in 1978 and

four weeks of workshops in 1979 provide both direct and indirect evidence for the successful implementation of our philosophy of education.

Weekly Evaluations, 1978

During our first weekly evaluation in 1978, we asked an open-ended question about which of the topics and demonstrations participants expected to use in their courses. Of the 29 respondents, 13 spontaneously listed the operant conditioning demonstrations, 11 listed a feedback exercise, and 10 an exercise on massed vs. distributed learning. The mean and median number of items listed was just over 3. Thirteen respondents gave a rather vague and general reply like "everything" or "almost everything," which was encouraging but provided less specific information than we desired.

For all subsequent weeks of the 1978 and 1979 workshops we listed each of the topics and activities covered that week and asked our respondents to indicate on a 5-point scale the likelihood that they would use each in their classes.

Evaluations conducted during the remaining two weeks of 1978 yielded some interesting information. (See Table 1.) In the 10 areas where workshop staff combined lectures with demonstrations and activities, the great majority of our participants reported a strong likelihood that they would incorporate these demonstrations and activities into their own curricula. For example, over 75% of the respondents indicated that they definately or probably would use the exercises on scientific method, ethical issues in research, naturalistic observation, adolescence, behavior modification and personality assessment. On the other hand, where guest speakers, either from universities or high schools, simply lectured on psychological content or methods for teaching, participants expressed little readiness to make use of the material in their classrooms. They did, however, express a strong intention to make use of self-developed curriculum materials and ideas shared in their guided discussions of issues such as volunteer

work.

Weekly Evaluations, 1979

Using the feedback aquired from our three 1978 workshop evaluations, we structured our four weeks of workshops in 1979 to provide the kind of integrated experiences our 1978 participants had favored. Our success was reflected in evaluations that we consider to be outstanding. Every topic and activity presented in every week of the workshop was considered very valuable or quite valuable by more than half the participants, and most of the time 80%, 90% or 100% of our participants gave these high ratings. Table 2 shows response to the activities of the second week, where our emphasis was most strongly on "hard science." Moreover, in almost every case more than half the participants expressed an intention to use the topics or materials, the exceptions generally being films that participants considered too expensive for their use.

Use of Resource Room

As part of our program, we encourage participants to borrow conditioning chambers and rats, books and curriculum materials, perceptual demonstrations and slide shows. Of these available materials, the rats and conditioning chambers have proved most popular. During the academic year following each workshop, approximately half the participants have borrowed a "Skinner box." and 1-3 rats. Additional teachers have reported borrowing rats or mice from their high school biology departments-sometimes making use, for the first time, of a resource available to them for years. Two participants in our 1980 workshop applied for, and received, a grant allowing them to develop their own set of scientific curriculum materials.

Discussion

Response to questions about the extent to which workshop participants would use new lessons, demonstrations, curricular units and materials have been highly favorable. A stated intention to use material in the classroom may not mean that teachers will in fact do so. However 50% of teachers stated that they would conduct a rat conditioning demonstration and 50% actually borrowed the operant

conditioning demonstrative unit. Unfortunately similar data are not available for other demonstrations primarily because they were originally designed to require little in the way of expensive equipment.

It is also important to note that teachers were very selective about their self report data. They reported that they intended to use only some of the activities and that their intentions were strongest when "hands on" demonstrations were provided.

Overall, both the self-report data and the use of rats and conditioning chambers appear consistent with our original assumptions: Workshops providing an active hands-on approach to scientific psychology, respect for the teacher's own abilities and experience, an enthusiastic and encouraging atmosphere, and the opportunity to discover and develop scientifically oriented curricular materials can be an effective and welcome means for helping pre-college teachers to develop and teach more scientific courses.

Our pre-and post-workshop survey data indicate that there is nothing unique about our particular sample of workshop participants as compared with other high school teachers in Massachusetts and across the United States. Moreover, like Cameron's (1975; note 1) participants in Pennsylvania summer institutes supported by the National Science Foundation, our participants seemed to find it easy to accept a philosophy of education which included the notion that the scientific method is not irrelevant to self-understanding or to healthy functioning in human society.

In the final analysis, the adoption and continued use of a more scientific curriculum may be dependent at least as much on student reactions as on teacher education in academic psychology. Student reaction, in turn, is probably dependent on both the students' needs and their teachers' ease with the material. Some evidence of our participants' ease with new materials comes from their regular

requests for loan of conditioning chambers and rats, perceptual demonstrations and slide shows, as well as their real eagerness to have us visit their classrooms and witness their innovations. Preliminary evidence concerning student reactions indicate that responses to conditioning and perception can be just as enthusiastic as responses to personality and abnormal psychology. Some open-ended responses to a question on a rat conditioning demonstration illustrate student interest nicely.

> I think it was great that we could do this experiment. It seems that we can read and write about all kinds of things in high school but we never get any first-hand experience.
>
> I enjoyed the experiment because it changed my conceptions of rats. The only rats that I've ever seen are ugly, big wet ones near the bank of the Charles River. I was amazed how quickly this rat learned to press the bar itself. By conditioning him to associate the click with the food, the rat showed his level of intelligence.
>
> I think the experiment was valuable and a success. It's good that we had a chance to do it. Experiments like this make the course more interesting and motivates the students. It makes studying psychology more "real" and relevant to our lives rather than a boring course where we read the book and have tests.

Reference

White, K.M., Marcucella, H., and Oresick, R. Psychology in the high schools. Teaching of Psychology, 1979, 6,39-42.

Notes

1. Cameron, S. National Science Foundation sponsored programs in high school psychology at Beaver College. Paper presented at the annual meeting of the Pennsylvania Psychological Association, June 6, 1975.

2. This article is based on a paper presented at annual meeting of the American Psychological Association, New York City, 1979. The project described in the paper was supported by a grant from the National Science Foundation (SPI 77-14709). Our thanks go to the participants and their students for their cooperation in the evaluation process. Special thanks go to Mrs. Jean Ashe of Dedham High School and to her students for their essays on conditioning rats.

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Table 1
Percentages of Respondents in Response Categories for Questions on likelihood of use for Workshop II and III (1978)

Activity	Instructor	Likelihood of Use: Definitely	Probably	Perhaps	Unlikely	No
Scientific Method Exercise	Staff	60	35	5	0	0
Ethical Issues Exercise	Staff	70	30			
Naturalistic Observation	Staff	60	25	15	0	0
Curriculum Groups	Staff	76	14	5	5	0
Minicomputers	Guest	5	10	35	25	25
Statistics Lecture	Guest	14	38	29	14	5
Adolescent Development	Staff	44	40	12	0	4
Behavior Modification	Staff	48	44	8	4	0
Resources for teachers	Staff	84	8	4	8	0
Statistics, Part II	Guest	8	24	36	40	0
Approaches to Personality	Guest	32	48	8	16	0
Using Film in Teaching	Guest	20	24	44	16	4
Teaching social power	Guest	12	44	36	12	4
Involving students	Staff	56	28	8	8	0
Special Topic Groups	Staff	40	20	12	0	0
Brain storming session	Staff	88	12	8	0	0
Changing values	Guest	20	20	28	20	4

Table 2

Evaluation of Workshop Activities: Week II (1979)

Activity	Overall Value (% responding very or quite valuable)	Likelihood of Using (% responding yes)
Operant Conditioning	93.8	75.0
Cup Approach & Bar Press Laboratory	87.5	50.0
Respondent Conditioning	87.5	86.7
Operant Lecture II	92.9	92.9
Bar Press Extinction Lab	93.3	75.0
Bio- Feedback Movie	58.3	38.5
Human Learning Lecture	92.9	71.4
Knowledge of Results Demonstration	84.6	76.9
Bilateral Transfer	83.3	66.7
Upsidedown & Backward Alphabet	90.0	70.0
Meaningfulness Experiment	90.0	60.0
Sensory Processes Lecture	73.3	53.3
Sensory World Movie	78.6	71.4
Magnitude Estimation Experiment	71.4	42.9
Depth-Perception Experiment	76.9	53.8
Behavior Therapy	93.8	81.3